

CLAIMS

- [1] An information recording medium having a recording layer including a data recordable area for recording user information signals, a lead-in area provided on the inner periphery of the data recordable area, an inner power calibration area provided further on the inside of the lead-in area for recording test recording patterns, and a recording management area for recording recording management information related to the inner power calibration area,
- 10 wherein an outer power calibration area is provided on the outer periphery of the final point of recording of the user information signal on the recording layer.
- [2] The information recording medium according to claim 1, wherein: the recording layer further includes a lead-out area, and
- 15 the outer power calibration area is provided between the data recordable area and the lead-out area.
- [3] The information recording medium according to claim 1, wherein the outer power calibration area forms part of the data recordable area.
- 20 [4] The information recording medium according to claim 1 or 3, wherein: there are provided a plurality of recording layers, recording of a user information signal on one recording layer out of two adjacently stacked recording layers among the plurality of recording layers is performed from the inner periphery to the outer periphery of the information recording medium and recording of a user information signal on the other recording layer of the two recording layers is performed from the outer periphery to the inner periphery of the information recording medium, and

in the one recording layer, the outer power configuration area is provided on the outer periphery of the final point of recording of the user information signal, and

5 in the other recording layer, the outer power configuration area is provided on the outer periphery of the starting point of recording of the user information signal.

[5] The information recording medium according to claim 1 or 3, wherein:
there is provided a plurality of recording layers, and

10 recording of a user information signal on all the plurality of recording layers is performed from the inner periphery to the outer periphery of the information recording medium and

the outer power configuration area is provided on the outer periphery of the final point of recording of the user information signal on each of the plurality of recording layers.

15 [6] The information recording medium according to claim 4 or 5, wherein
in an nth inner power calibration area, an (n+1)th inner power calibration area, an nth outer power calibration area, and an (n+1)th outer power calibration area provided, respectively, on an adjacently stacked nth recording layer and (n+1)th recording layer, test recording execution areas 20 provided in the respective power calibration areas are provided such that they don't mutually overlap in the direction of stacking of the recording layers.

[7] The information recording medium according to any of claims 4 through 6, wherein

25 the direction of test recording performed for power calibration in the nth inner power calibration area and in the nth outer power calibration area is opposite to the direction of recording of the user information signal on the nth recording layer.

- [8] The information recording medium according to claim 4, wherein
an nth outer power calibration area and an (n+1)th outer power
calibration area are provided, respectively, in an adjacently stacked nth
recording layer and (n+1)th recording layer, with an nth middle area provided
5 on the inner periphery of the nth outer power calibration area in the nth
recording layer, and an (n+1)th middle area provided on the inner periphery
of the (n+1)th outer power calibration area in the (n+1)th recording layer.
- [9] The information recording medium according to claim 8 wherein
in each adjacently stacked nth recording layer and (n+1)th recording
10 layer, the nth middle area and the (n+1)th middle area, as well as the nth
power calibration area and the (n+1)th power calibration area, are arranged
by shifting them, in their entirety, towards the inner periphery, such that at
least a portion of the nth middle area and the (n+1)th middle area, as well as
the nth power calibration area and the (n+1)th power calibration area, is
15 positioned on the inside of the outermost location that permits recording user
information signals.
- [10] The information recording medium according to any of claims 1
through 9, wherein the outer power calibration area is provided in a circular
fashion at a distance of at least 0.2 mm on the outside from the outermost
20 recordable location in the data recordable area.
- [11] The information recording medium according to any of claims 1
through 10, wherein recording management information related to the outer
power calibration area also is recorded in the recording management area.
- [12] The information recording medium according to any of claims 1
25 through 11, wherein an outer recording management area used for recording
recording management information related to the outer power calibration
area is provided on the outside of the data recordable area.
- [13] The information recording medium according to any of claims 1

through 12, wherein a test recording pattern is recorded in the outer power calibration area when the data recording speed in the data recordable area is a predetermined speed or higher.

[14] The information recording medium according to any of claims 1
5 through 12, wherein a test recording pattern is recorded in the outer power calibration area when the data recording speed in the data recordable area exceeds the recording speed at which recording was performed in the data recordable area in the past.

[15] An information recording and reproducing device for recording
10 desired user information signals in the data recordable area of the information recording medium according to any of claims 1 through 14, comprising:

a rotary drive unit that rotates the information medium,
an optical pickup that performs information signal recording or
15 information signal reproduction by irradiating the information recording medium with light, and

a calibration control unit that performs calibration of irradiation power using the optical pickup by moving the optical pickup at least to either one of the inner and outer power calibration areas of the information recording medium.

[16] The information recording and reproducing device according to claim 15, further comprising a rotation control unit that controls the speed of rotation of the information recording medium by the rotary drive unit,

wherein the calibration control unit acquires information on the rotational speed of the information recording medium from the rotation control unit and, depending on the acquired rotational speed information, and determines in which to perform calibration of the irradiation power using the optical pickup, whether the inner power calibration area or the outer power

calibration areas.

[17] The information recording and reproducing device according to claim 16, wherein the calibration control unit carries out irradiation power calibration using the optical pickup in the outer power calibration area when 5 the speed represented by the rotational speed information exceeds a predetermined speed.

[18] The information recording and reproducing device according to any of claims 15 through 17, further comprising means for copying the newest test recording pattern from among the test recording patterns stored in the inner 10 power calibration area to the outer power calibration area whenever a recording operation begins.

[19] The information recording and reproducing device according to any of claims 15 through 18, further comprising means for copying inner recording management information kept in the inner recording management area of 15 the information medium to the outer recording management area of the information medium when recording a user information signal.

[20] The information recording and reproducing device according to any of claims 15 through 19, further comprising means for erasing test recording patterns corresponding to the data to be erased among the test recording 20 patterns recorded in the outer power calibration area when erasing data from the data recordable area.

[21] The information recording and reproducing device according to any of claims 15 through 20, further comprising means for erasing recording management information corresponding to the data to be erased among the 25 recording management information kept in the outer recording management area when erasing data from the data recordable area.

[22] The information recording and reproducing device according to any of claims 15 through 21, wherein:

information representing the extent of the writable area of the data recordable area is contained in the recording management area of the information recording medium, and

the information recording and reproducing device further includes
5 means for modifying the information representing the extent of the writable area of the data recordable area so as to move the outermost periphery of the writable area on the information recording medium towards the inner periphery.

[23] An information recording and reproducing device for recording
10 desired user information signals in the data recordable area of the information recording medium according to any of claims 4 through 9, comprising:

a rotary drive unit that rotates the information recording medium,
an optical pickup that performs information signal recording or
15 information signal reproduction on a recording layer by irradiating any of the recording layers among the plurality of recording layers provided in the information recording medium with light, and
and a calibration control unit that performs calibration of irradiation power using the optical pickup by moving the optical pickup at least to either
20 one of the inner and outer power calibration areas of the information recording medium on the recording layer where one intends to perform recording or reproduction of an information signal.